VIDEO OTOSCOPY

Background

This project is to support the overall goal of establishing a virtual Otolaryngology Clinic. Currently we are evaluating the feasibility of triaging patients using video-otoscopy. Hearing loss has been and continues to be the number one or two occupational injury in the military. The annual cost in hearing loss claims to the Army alone exceeds $100 million per year. Additionally the loss of hearing from occupational exposure changes the forward mix for combat units and impacts mission performance. Costs of training skilled combat arms member, i.e. pilots, tank crews, armor crews, are but a few of the documented cases of performance dependent on good hearing.

Organization

Principal Investigator -CDR Michael R. Holtel, M.D.
Principal Investigator - Leslie J. Peters, Ph.D.
Co-Investigator - COL Lawrence Burgess. M.D.
Co- Investigator - Deborah P. Birkmire-Peters, Ph.D.
Co-Investigator - Mark Syms, M.D.
Project Manager - Steve Middaugh, M.S., P-EIC

Research Question - Determine the feasibility of using Store-and-Forward video images for the triage of ear cases in the Otolaryngology Service.

Goals and Objectives

Goals

1. Off Site Data Collection
2. Install acquisition systems at three (3) additional sites: ENT Clinic, Possibly Community Medical Center, Off-Site Pacific and USACHHPM
3. Let Contract for Part-Time Audiologist

Objectives

1. Phase II (short term): Collect data to establish normalization of procedure. Establish medical/legal documentation to create standard of care in video-otoscopy (intermediate term): Seek customer funding to implement established standards of care in video-otoscopy. Hearing conservation would be one application.
2. Phase III (long term):
   a. Establish a training course in video-otoscopy.
   b. Create a certification procedure in video-otoscopy.
   c. Create an evaluation procedure in video-otoscopy.
   d. Develop digital analysis of images, image and pattern recognition software to increase accuracy of diagnosis.

e. Incorporate video-otoscopy into T2P2 and subsequent telemedicine systems.
f. Facilitate placement of video-otoscopy technology into the DOD Hearing Conservation Program.

Current Status

a) Primary Accomplishments (Nov 1999- March 00)

1. Presented Papers entitled " A Comparison of Hand-Held Otoscopy and Microscopy To Video-Otoscopy" and "Telemedicine Applications in Hearing Conservation" at *Medicine Meets Virtual Reality"* Conference in Jan 2000
2. Data Analysis Completed For Comparison

b) Project Timelines

1. Ship Acquisition Station to USACHPPM
2. Field Remote Sites

Strategic Direction

Accomplishment of Objectives-

(short and intermediate objectives) These will be accomplished through in-house research efforts. A hierarchical series of efforts is planned. These results will lead to an established SOP.

(Long term objectives) Will be established through a cooperative effort with the University of Hawaii, Communicative Disorders Department. A center for excellence in distance learning in communicative disorders will be created.

Utilization of image recognition software and digital analyses will potentially increase the accuracy of diagnoses over current standard examinations.

Military Significance -

Hearing loss is the number one occupational injury. Compensation by the Army for hearing loss was $112 million in 1996. With implementation of a complete program to include remote audiology and video-otoscopy, a 10% reduction per year in compensation for hearing loss can be achieved over 5 years.

Impact on customers-

Our customers are remote patients and providers of health care. Success means improved patient care, better patient outcomes, reduced costs.

Business Associations

Corporate partnerships - N/A

University Partnerships - Georgetown University Medical Center
University of Hawaii, Department of Communication Disorders

Government Partnerships - US Army Research Laboratory
USACHPPM

TAMC IMD - network assistance, software assistance, hardware assistance

Project Security

System security: N/A at this time

Standards compliance measures: uses open architecture, interfaces with existing systems and is incorporated behind TAMC "firewall".

Summary

The video-otoscope project is behind on time and under budget. Preliminary analysis of the data indicated a strong degree of association between the examinations performed with the hand-held or microscopic examinations and the evaluations of the video-otoscopic images. The results strongly support further research into this area. Our second year should see the formal establishment of MOU's leading to customer funding as early as year three. This project marks the turning of telemedicine from "talking heads" to innovative medicine with a customer base.